Using a citizen science tool to model the health benefits of roadside trees

Conference or Workshop Item

Using a citizen science tool to model the health benefits of roadside trees

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April 2017

@treezilla_org

Health effects of air pollution

Cardiovascular and pulmonary diseases linked to transportation

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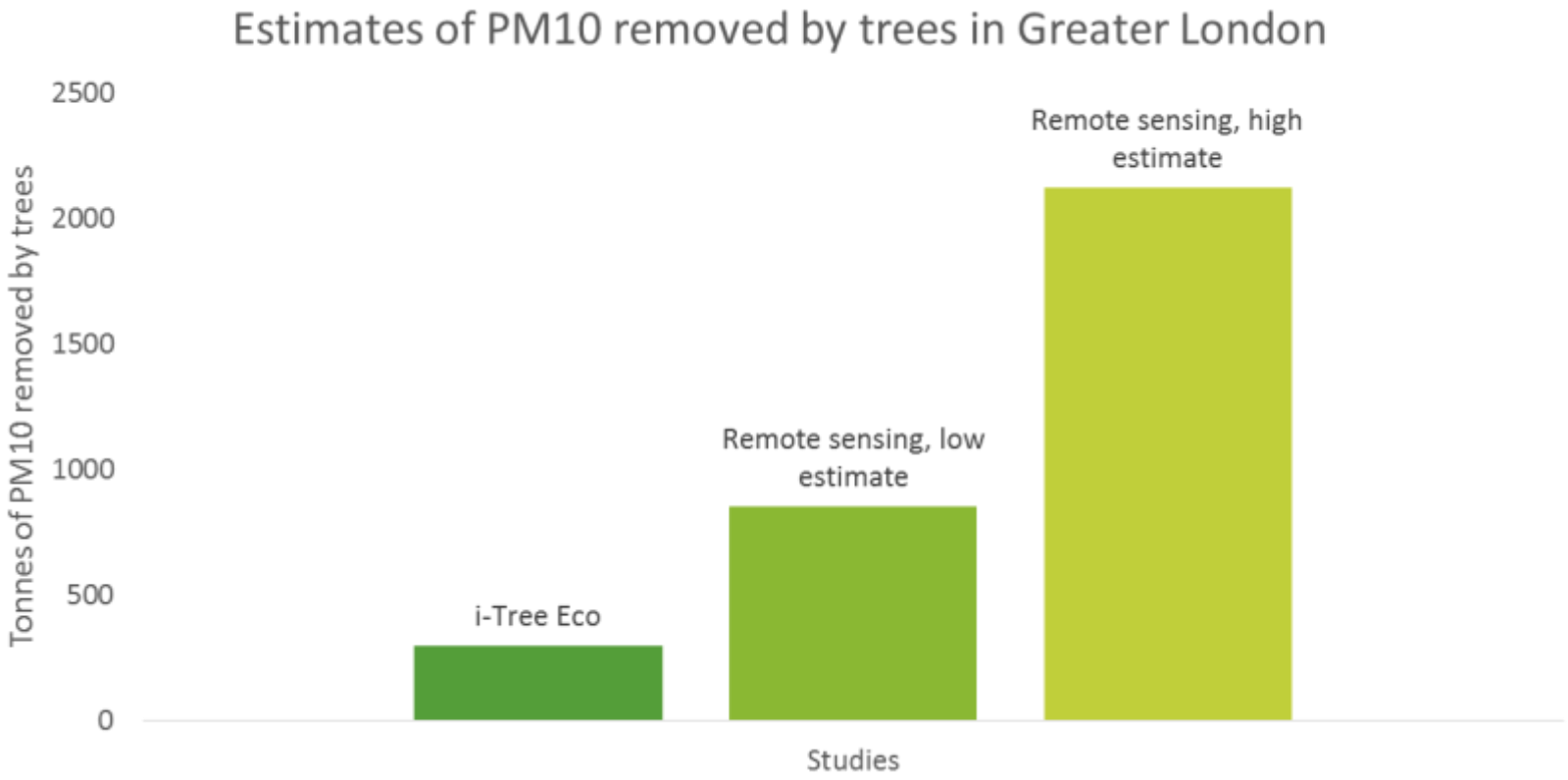
Roadside trees improve the urban environment

- Provide shade
- Slow cars down
- Reduce the urban heat island effect
- Filter air pollution

Previous studies on trees and particulate matter

- i-Tree Eco (Rogers et al., 2015)
- Remote sensing (Tallis et al., 2011)



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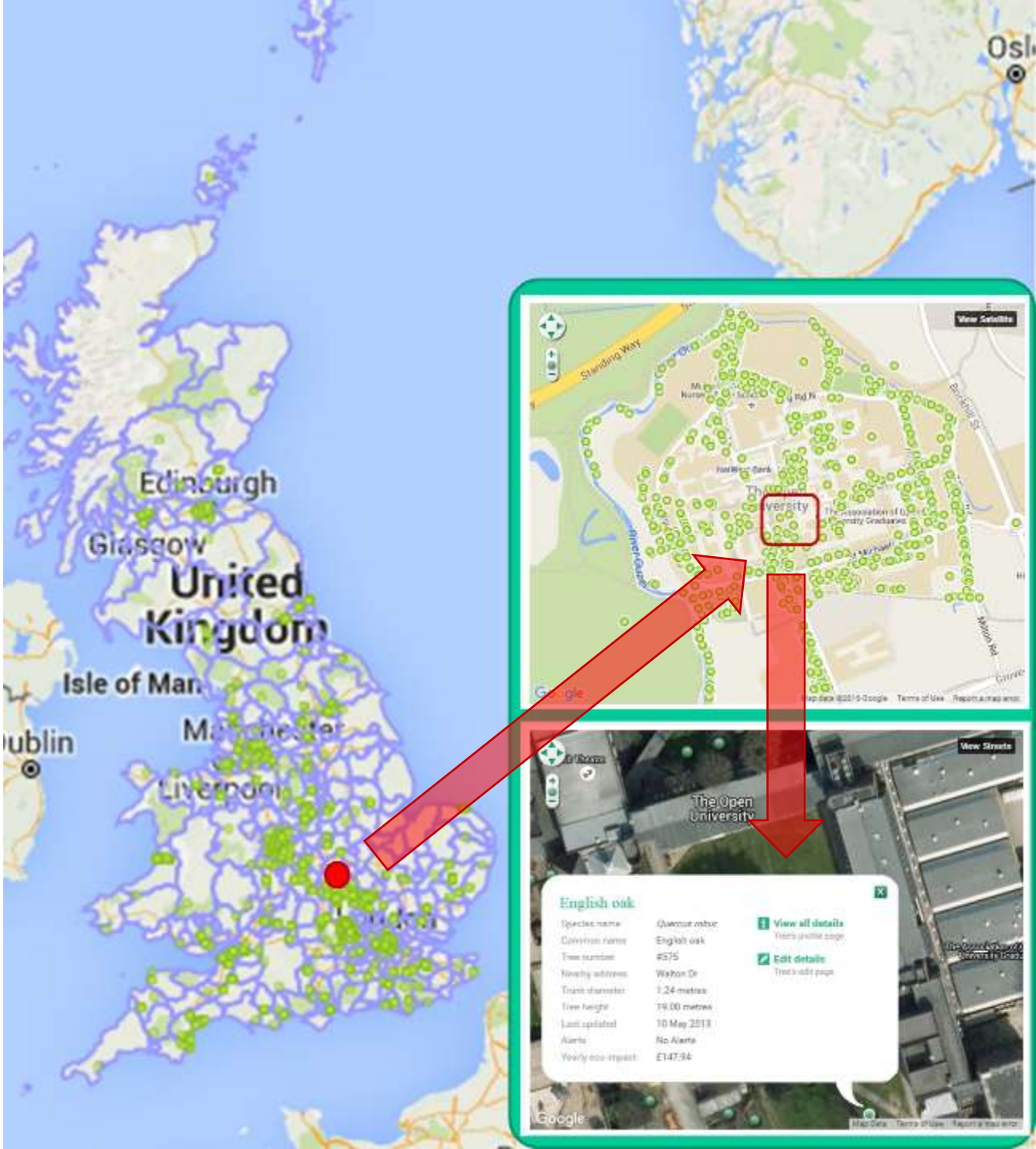
Valuing trees the citizen science way

- OpenTreeMap: learning about the value of individual trees
- Treezilla: developing a ‘monster map of trees’ for GB



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Project VITAL:
Valuing Green Infrastructure Through Tree Assessment Tools

www.treezilla.org

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Benefits of a citizen science approach

Treezilla.org is a platform that can help:

- Highlight the role of trees in urban environments and the ecosystem services they provide
- Help the general public learn and contribute
- Acknowledge this contribution and its role in the care and welfare of trees

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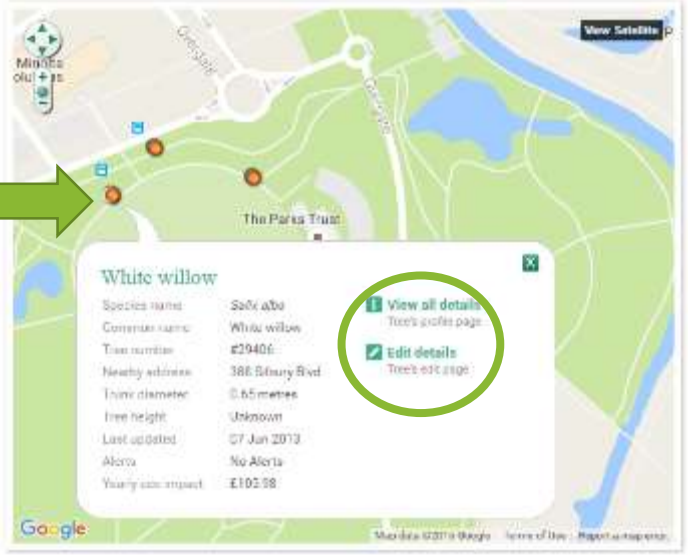

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Using Treezilla to study the removal of PM_{10} by roadside trees

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Grid roads and their trees

- Milton Keynes: a new town planned with a network of grid roads
- Unintended benefits of ‘screening’ the roads

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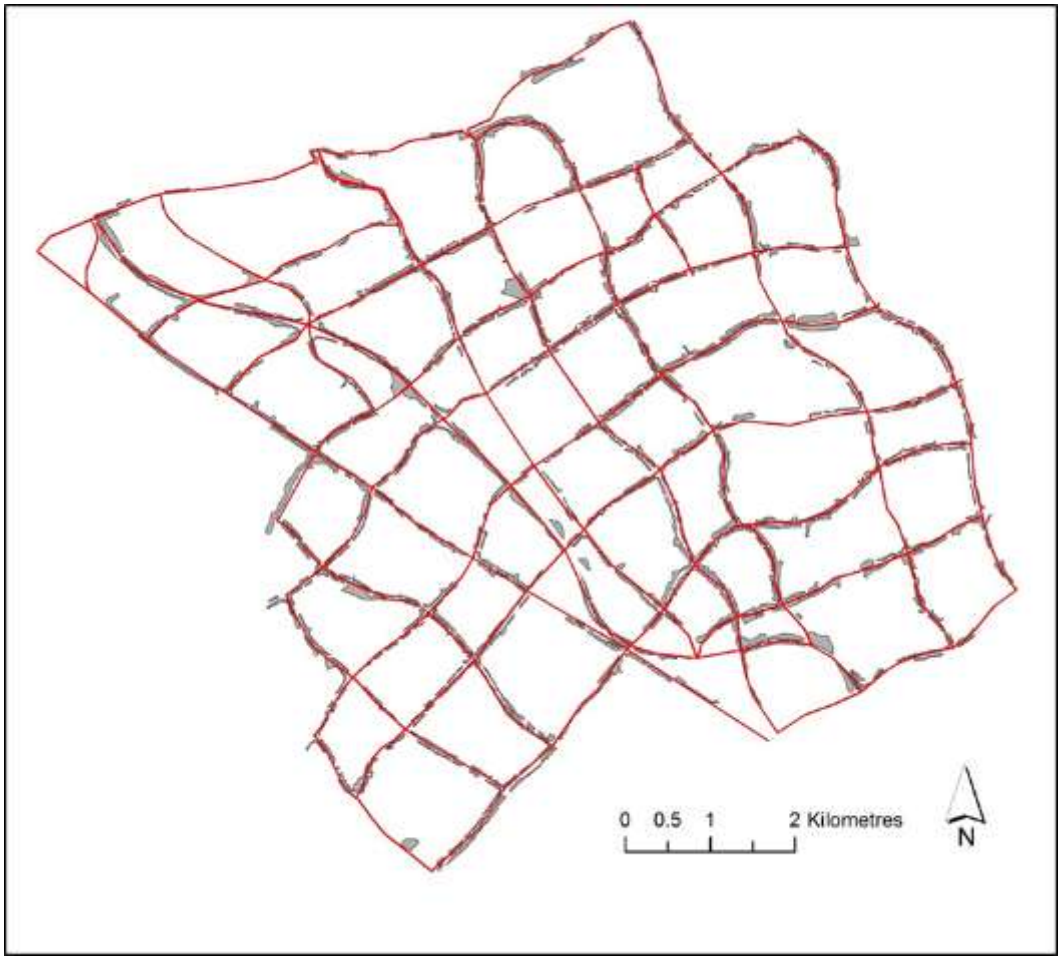
Grid road trees mapped: ~430ha within 50m of carriageway



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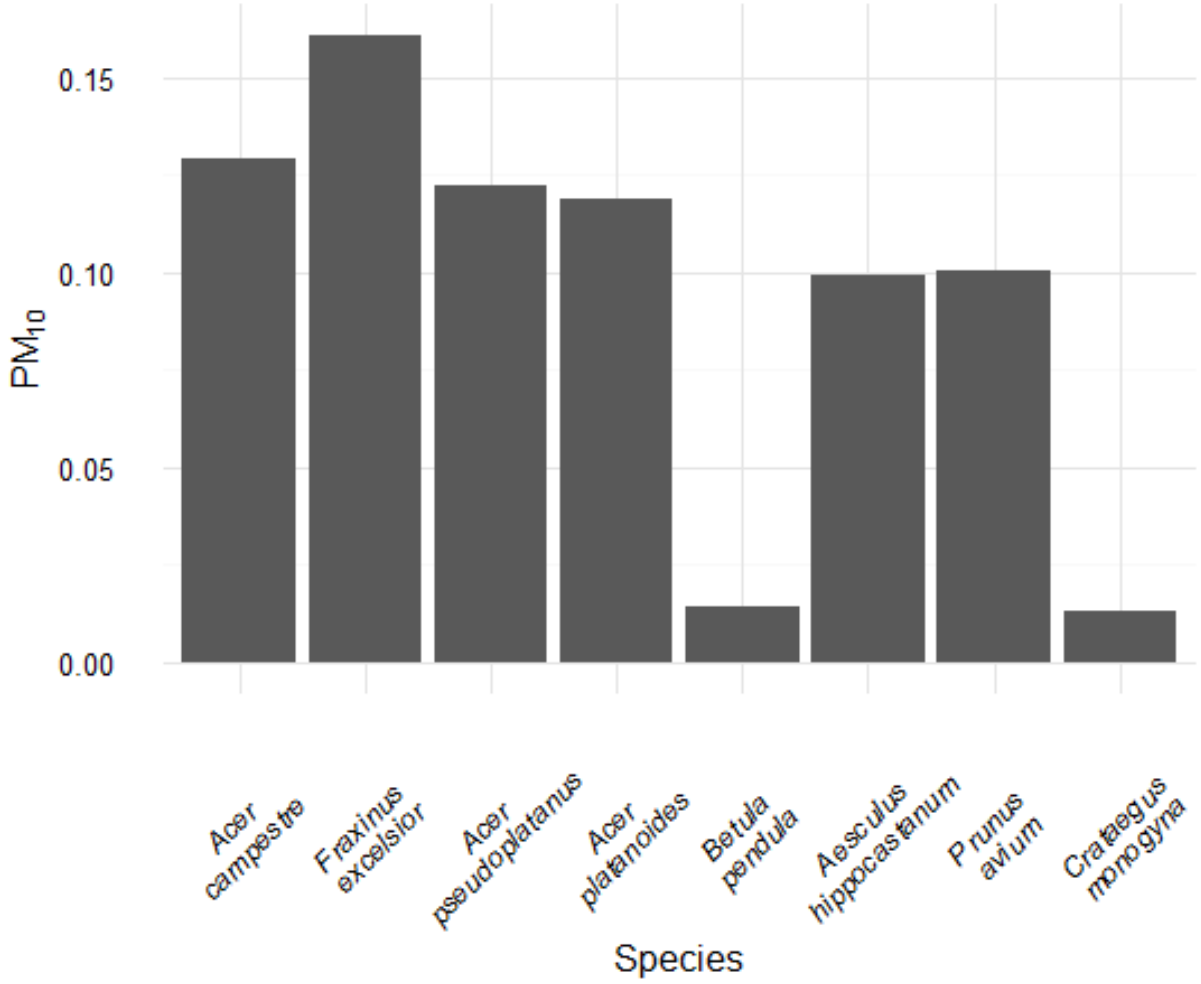
Proportion of PM_{10} removal by 8 most common species



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PM_{10} removal across MK

- 22.36 kg/ha
- 9.6 tonnes overall for the planted area of grid roads in MK
- 5.5-6.3% of estimated annual exposure for the high and low pollution scenarios respectively

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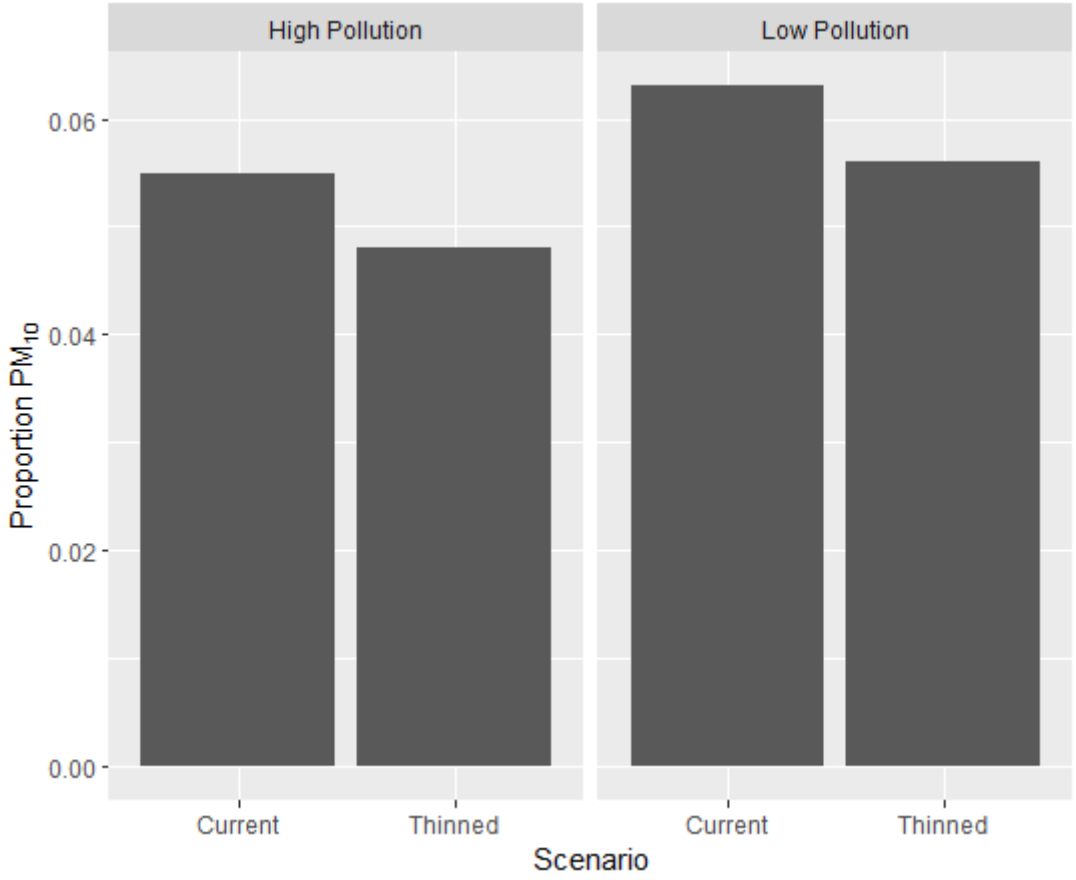
Managing roadside trees

Thinning to:

- Promote larger trees
- Improve visual amenity
- Increase ground flora diversity

Effects of thinning on PM_{10} removal



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Value of pollution reduction

In Treezilla:

- £14,568 under current conditions;
- £12,998 under the thinning scenario.

By UK government figures:

- £637,115 under current conditions;
- £568,445 under the thinning scenario.

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Challenges

- Mapping at street level difficult with consumer GPS
- Co-ordinating citizen scientists at scale
- Which figures to believe: PM_{10} and £££?

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Conclusion

- A citizen science tool can provide sensible ball-park estimates of PM_{10} removal.

- Uncertainties remain over precision of estimates and associated valuations.

  But these are not specific to the citizen science approach

- Future developments will enhance the ability of Treezilla to contribute to baseline assessments and decisions over management.

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Acknowledgements

Project team

Forest Research

Treeconomics

The Open University

Project partners

The Tree Council

Cyfoeth Naturiol Cymru
Natural Resources Wales

The Parks Trust
MILTON KEYNES

Project VITAL
funded by
NERC SCIENCE OF THE ENVIRONMENT

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